

Claims:

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1. A mobile station comprising:
- 5 a first antenna;
- a first radio frequency processing circuit receiving and processing signals
- from said first antenna;
- a second antenna;
- a second radio frequency processing circuit receiving and processing
- 10 signals from second antenna; and
- a base band processing circuit receiving processed radio frequency signals
- from said first radio frequency processing circuit and from said second radio
- frequency processing circuit for diversity, and providing a control signal to said
- second radio frequency processing circuit to selectively activate and deactivate
- said second radio frequency processing circuit based on a determination as to
- whether diversity is appropriate.
- 15 2. A mobile station in accordance with claim 1 wherein said first radio
- frequency processing circuit also transmits signals from said mobile station.
3. A mobile station in accordance with claim 1 wherein said control
- signal generated by said base band processing circuit is controlled by a control
- signal from a base station with which said mobile station is in communication.
- 20 4. A mobile station in accordance with claim 3 wherein the base
- station will increase or decrease its output power to said mobile station after
- transmitting said control signal until a sufficient signal quality of the
- communication link.

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5. A mobile station in accordance with claim 1 wherein said mobile station informs a base station of its deactivation of diversity so that the base station will adjust its output power until a sufficient signal quality is achieved in accordance with the non-diversity mode.

5 6. A mobile station in accordance with claim 1 wherein said determination as to whether diversity is appropriate is based on a signal quality of a demodulated signal.

10 7. A mobile station in accordance with claim 1 wherein said determination as to whether diversity is appropriate is based on a level comparison diversity technique.

8. A mobile station in accordance with claim 1 wherein said determination as to whether diversity is appropriate is based on a likelihood comparison technique.

15 9. A mobile station in accordance with claim 1 wherein said determination as to whether diversity is appropriate is based on a measure of bit error rate of a demodulated signal.

10. A mobile station in accordance with claim 1 wherein said determination as to whether diversity is appropriate is based on a measure of frame error rate of a demodulated signal.

20 11. A mobile station in accordance with claim 1 wherein said determination as to whether diversity is appropriate is based on a measure of a signal to interference ratio of a demodulated signal.

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12. A mobile station in accordance with claim 1 wherein said determination as to whether diversity is appropriate is based on a measure of the number of re-transmissions required.

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a' 13. A method of controlling diversity in a mobile station, comprising:
receiving a radio signal on a first antenna;
processing radio signals from said first antenna in a first radio frequency processing circuit;
receiving radio signals in a second antenna;
processing radio signals from the first antenna in a second radio frequency processing circuit;
10 receiving processed radio frequency signals from said first radio frequency processing circuit and from said second radio frequency processing circuit for diversity in a base band processing circuit;
determining whether diversity is appropriate; and
15 providing a control signal to said second radio frequency processing circuit to selectively activate and deactivate said second radio frequency processing circuit based on said determination as to whether diversity is appropriate.

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B5 14. A method in accordance with claim 13 further comprising
controlling the generation by said base band processing circuit of said control
20 signal by a control signal from a base station with which said mobile station is in communication.

15. A method in accordance with claim 14 further comprising adjusting an output power of the base station to said mobile station after transmitting said control signal until a sufficient signal quality of the communication link.

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16. A method in accordance with claim 13 further comprising said mobile station informing a base station of its deactivation of diversity so that the base station will adjust its output power until a sufficient signal quality is achieved in accordance with the non-diversity mode.

5 17. A method in accordance with claim 13 wherein said determination as to whether diversity is appropriate includes measuring a signal quality of a demodulated signal.

10 18. A method in accordance with claim 13 wherein said determination as to whether diversity is appropriate includes employing a level comparison diversity technique.

19. A method in accordance with claim 13 wherein said determination as to whether diversity is appropriate includes employing a likelihood comparison technique.

15 20. A mobile station in accordance with claim 1 wherein said determination as to whether diversity is appropriate is based on a measure of at least one of the group consisting of a bit error rate of a demodulated signal, a frame error rate of a demodulated signal, a signal to interference ratio of a demodulated signal, and the number of re-transmissions required.

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